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Benefits of Entrenching Animal Disaster Management and Livestock Emergency Guidelines Standards (LEGS) Courses into the Veterinary Curriculum: Case study of the University of Nairobi, Kenya

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ABSTRACT

Disaster-vulnerable communities are mostly those reliant on livestock. Disasters causing loss of livestock often leave a secondary legacy of economic instability, debt and dependency in addition to immediate devastation of food insecurity and loss of human life. It is prudent to build capacity as a strategy to manage and mitigate these type of disasters. A 4-year program for capacity building on animal disaster management was instituted at the faculty of veterinary medicine in University of Nairobi to evaluate its benefits. The program was evaluated through monitoring and evaluation tools and a post-program knowledge, attitudes and practices survey. Stakeholders (270 students) were interviewed during the program period and others (n=110) after the program period in the process of the review of the veterinary curriculum. A total of 184 students and 12 lecturers were trained on disaster management modules, 200 trainees on livestock emergency guideline standards (LEGS), and two lecturers as LEGS trainers. Over 60% of those interviewed were aware the programs existed and over 70% indicated the program had benefits (n = 380). The stakeholders significantly (n= 270, P = 0.01; n=110, P = 0.02) indicated the need to entrench the disaster management and LEGS courses into the veterinary curriculum. A cost-benefit analysis of the veterinary response unit disaster intervention activity demonstrated generated benefits of $2.74 in the form of avoided animal losses for every $1 spent. If the time period was extended to 3 and 5 years, the benefit-cost ratio increased to $6.69 and $ 9.21, respectively, in benefits for every $1 spent. These results demonstrate there are benefits of entrenching the courses into the veterinary curriculum and a recommendation is made for the inclusion of the courses in all curricula lacking the courses.

Key words: Animal management, Benefit, disaster, Livestock and University curricula.

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INTRODUCTION

Disasters always impact heavily on vulnerable communities in developing countries (Mutembei et al., 2015). Whenever they occur, for the affected community, they erode development initiatives, challenge the capacities of vulnerable groups, and frequently overwhelm process of recovery to the pre-crises socio-economic state (UNDP Report, 2011). The livelihoods assets of the affected communities are disrupted in terms of displacement, damage and loss of economic activities (ISDR Report, 2002). To secure such communities, proper mechanisms of disaster mitigation and management are key to sustainable development, especially in reducing the population vulnerability by minimising destruction on livelihood assets (GIZ report,

2002). Livestock is the main livelihood asset for most vulnerable communities in developing countries (Nakami et al., 2015; Ndeke et al., 2015). Thus, if clear national policies and mechanisms for disaster response are in place, there would be minimal damage for the communities in times of disasters (Mutembei et al., 2015). However, whenever disasters occur, especially those affecting animals, no such mechanism are in place and only ad hoc interventions take place (Buchanan, 2000). Inadequate finances, weaknesses in disaster mapping and identification, and lack of good political goodwill hamper disaster response and mitigation processes in many developing countries (joint UNDP, WMO, GOK, IGAD, and DMCN report, 2002).

The main disasters affecting livestock livelihood asset of the communities in countries like Kenya are droughts and flooding (Government of Kenya report, 2009; Mutembei et al., 2015; Nakami et al., 2015). Despite this knowledge existing, animals are often forgotten victims during these disasters, probably due to poor link between livestock asset and livelihoods or simply lack of political goodwill (Nusbaum et al., 2007; Behke and Muthami, 2011). Animals suffer the effects of droughts, flood, famine and conflicts as humans do and initiatives supporting animals during these situations have been shown to help restore and secure an asset that make the communities cope better with the effects of disasters (Global Facility for Disaster Reduction and Recovery report, 2011). Capacity building is key to any disaster risk reduction initiative (ISDR report, 2002). However, until to date, very few initiatives exist that entrench capacity building on animal disasters as mitigation and management strategies. This paper is a show-case initiative demonstrating the benefits and the need to entrench animal disaster management and LEGS courses within veterinary curriculum for enhanced disaster management process.

MATERIALS AND METHODS

An operational center of excellence for management of animals in disaster situations was created within the University of Nairobi (UoN) at the Faculty of Veterinary Medicine (FVM). The objectives of the center were to (i) pilot-test a 5-year introduction of animal disaster management courses (DM modules, Livestock Emergency Guidelines Standards (LEGS), and Veterinary Response Unit (VERU), (ii) evaluate the benefits of the program for informed decision making during curriculum review; select veterinary students were to graduate equipped with specialized knowledge, skills and core competencies in DM, LEGS and VERU, and (iii) make recommendations on entrenchment of DM, LEGS and VERU courses into the curricula during the process of reviewing the veterinary curriculum based on feedbacks of stakeholders. The pilot-test process involved the following stages; (1) an initial stakeholder workshop for sensitization, (2) identification of the management unit, (3) recruitment of trainers, (4) Training of trainers, (5), development of training materials by trainers, and (6) training of four annual batches of veterinary students.

The training was done every year for a period of 4 years (2011 to 2014) on a voluntary basis model. The training was based on a 12-module course; types of disasters, principles of emergency management, handling animals in disasters, emergency shelters, feeding in disasters, assessment and operation planning, deployment, health and safety, infectious diseases in disasters, veterinary response, data and information collection, and risk reduction and preparedness planning. These modules were trained using theory and experiential field learning. In addition, the 3-day course on Livestock Emergency Guidelines Standards was also offered every year. In cases of national disasters, the trained personnel were involved in veterinary response interventions. The training methodology comprised of:- (a) interactive introductions of participants to create a conducive learning environment to encourage every individual to participate, (b) giving every participant copies of training materials to enhance interaction, (c) training each module by enlisting what it covers, presenting the topics, allowing participants to make contributions and give their experiences, and giving summary of key messages, (d) LEGS participatory approach group work and feedback from groups, and (e) energizers to keep learning momentum high.

The methodology ensured full participation and accorded the trainees ample opportunity to seek clarifications when necessary. Monitoring and evaluations of the program by the participants was done in every year using an end of training questionnaire capturing the attributes on relevance and potential benefits of the courses. Also participant's feedbacks on what went wrong and right during the training was captured to inform on future trainings. A post-program knowledge, attitudes and practices (KAP) survey was conducted through interviews of 270 students (key stakeholders) and 110 other stakeholders during the review process of the veterinary of curriculum. Attributes on benefits of the courses and the need to entrench the courses within the curriculum were captured. A chi-square analysis of the categorical responses of the stakeholders on the need to entrench each of the courses (DM modules, LEGS, and VERU), was carried out. An evaluation of one of the VERU model of intervention to disasters was done using cost-benefit analysis based on post-intervention reports. The analysis aimed to assess the number of animals reached, the total cost of the intervention and the benefit/cost ratio. This analysis took into focus the household income impacts to owners of livestock who brought their animals for the intervention without considering indirect costs and benefits of the intervention relating to other sectors and

Table 1. A 4-yr Summary of trainings on DM modules.

	2010	2011	2012	2103	2014	Total
Lecturers	12	-	-	-	-	12
Students	-	44	45	47	48	184
Total	12	44	45	47	48	196

Figure 1. Field Disaster Management experiential learning (A) and LEGS trainees (B).

Table 2. A 4-yr Summary of trainings on a 3-day LEGS course.

	2010	2011	2012	2013	2014	Total
Trained LEGS trainers	-	-	-	-	2	2
Lecturers	-	12	-	-	-	-
Students	-	38	50	50	50	188
VERU interventions	-	2	1	-	-	3
Total	-	52	51	50	52	203

industries. An economic contribution of the intended aim of the intervention was assed (i.e. increasing prospects of animals to survive the disaster from the intervention offered).

RESULTS

In the four-year period 184 veterinary students and 12 lecturers (Trainers) were trained on DM modules (Table 1 and Figure 1A). For the LEGS course, 188 students and 12 lecturers were trained and two lecturers underwent ToT training to become LEGS trainers. The VERU intervened three times; 2011 on drought and 2013 on community conflicts (Table 2 and Figure 1B). Four of the trainees on LEGS were from NGOs. Stakeholder knowledge, attitudes and practices (KAP) on animal disaster management program are shown in Table 3. Generally, the stakeholders were aware the program existed (over 60%) and that the courses were useful to veterinarians and in disaster management (over 75%). All stakeholders significantly indicated the need to entrench the DM, LEGS and VERU courses within the curriculum (Table 4). The cost-benefit analysis of a drought veterinary response intervention activity (Figure 2) indicated that in 1-year time period, the intervention generated $2.74 of benefits in the form of avoided animal losses for every $1 spent. If the time period was extended to 3 and 5 years, the benefit-cost ratio increased to $6.69 and $9.21, respectively, in benefits for every $1 spent (Table 5).

DISCUSSION

Capacity building on animal disaster management is

Table 3. Respondent's knowledge, attitudes and practices on the courses.

n=270 for students, n=110 for other stakeholders	Students	Others
Knowledge awareness the program offered the skills	97% ±0.12	61% ±2.14
Knowledge awareness previous veterinarians lacked the skills	82% ±0.65	81% ±0.29
Knowledge awareness the skills are useful for veterinarians	94% ±1.16	97% ±0.51
Knowledge awareness the skills are useful in disaster management	79% ±2.78	92% ±1.94

Table 4. Chi-square analysis on the need to entrenchment DM, LEGS and VERU courses within veterinary curriculum based on stakeholders responses (n=380).

DM, LEGS AND VERU	Analysis
DM courses are needed within the curriculum	$X^2 = 11.41$, P= 0.01
LEGS courses are needed within the curriculum	$X^2 = 10.64$, P= 0.01
VERU courses are needed with the curriculum	$X^2 = 10.83$, P= 0.02

Figure 2. VERU intervention activity against drought in 2011.

important because impacts of disasters are high in vulnerable pastoral communities (Nakami et al., 2015; Mutembei et al., 2015). This becomes even more prudent for developing countries where affected people cannot earn "a dollar a day" (Joint UNDP, WMO, GOK, IGAD and DMCN report, 2002). Thus, pilot-testing a program of such courses in countries like Kenya is justified because many of the disaster-prone poor people are the smallholders, who largely depend on animals for their livelihood (Mutembei et al., 2015). The program, though on voluntary basis, attracted 200 trainees for LEGS, and 196 for DM modules. It was only possible to attract a limited number of non-UoN trainees for LEGS, accounting for only four from NGOs. This was possible because LEGS training was done on a 3-day course outline for 25 trainees only. This need for these trainings were apparent given that even though animals are the main source of community livelihood, animal disaster management courses in Kenya were lacking (Government of Kenya report, 2009). Thus, persons seeking the training felt the need to acquire skills so as to intervene in situations where animals get forgotten in

Table 5. Cost benefit analysis undertaken on a VERU drought intervention activity.

1. Intervention details		
Treatments provided	Number	36,452
Animals treated	Individual	20,707
Animals saved	USD	10,354
Cost of Intervention	USD	39,968
Cost per treatment	USD	1.10
Cost per animal	USD	1.93
2. Estimates and discount rate		
Annual Income of Livestock Saved	USD/annum	136,925
Discount Rate	%	25%
3. Net present value over 1,3 and 5 years		4. Benefit/Cost Ratio
NPV 1 Year	USD 109,540	2.74
NPV 3 Year	USD 267,278	6.69
NPV 5 Year	USD 368,230	9.21

Key: (1). Basic intervention details based on VERU post-intervention reports, (2). Estimates of the potential income of the animals saved by the intervention, (3). Net present value estimates over 1, 3 and 5 years and (4). Benefit-cost ratios over 1, 3 and 5 years.

preparedness, response and mitigation of disasters (Buchanan, 2000).

It has been demonstrated that animals play major roles in all the components of disaster management (ISDR report, 2002; Behnke and Muthami, 2011; UNDP report, 2011; Mutembei et al., 2015). Therefore, skills acquired during the training would safeguard livestock asset during disasters as an essential cultural element in maintaining man's traditional life style (Yesuf and Bluttstone, 2008). For example, in Kenya, animals like sheep and goats in some regions have made it possible for humans to live in drought disaster prone areas where production of crops is virtually impossible (Government of Kenya, report 2004; Kenya National Bureau of Statistics report, 2012; Nakami et al., 2015; Ndeke et al., 2015). All interviewed stakeholders indicated benefits for DM and LEGS courses and the need to entrench such courses within the veterinary curricula. Also, the VERU response intervention activity generated benefits. Depending on duration, the present value of the intervention generated benefits of $ 2.74, 6.69 and 9.21 over 1, 3 and 5 years, respectively, for every $ spent. Although it is the veterinary profession's duty to respond to disasters involving animals (Nusbaum et al., 2007), the results of this pilot-test demonstrates a need for the strategy to include disaster courses on preparedness, response and recovery activities to enhance the survival of livestock-dependent communities during disasters. Thus, animal welfare should be viewed not only as an integral part of disaster recovery but ultimately as a supporting component of humanitarian relief work, and should be included as part of planning for disasters from the start (Nusbaum et al., 2007).

Animals are key during disaster management because they provide means of transport of food and water, and of invalid people when no other transport is possible (Mutembei et al., 2015). They are also movable assets of the farmer, which can be salvaged and used during response period or while victims live in shelters (Ndeke et al., 2015). Even in their death, they can serve the community by providing material gains, with their hide, bone, lard and carcass (GIZ report, 2002; ISDR report, 2002; Global facility for disaster reduction and recovery report, 2011). Again, in disasters, damaged crops can easily be used as animal feed and fodder. Critically, also animal rearing is a major diversion from shock for disaster victims and helps them tide over their depression (Buchanan, 2000; Nusbaum et al., 2007; Mutembei et al., 2015).

In this case study, a strategy to entrench disaster management courses into the veterinary curriculum in Kenya has been demonstrated. The strategy led to a successful review of the veterinary curriculum that incorporated DM modules, LEGS and VERU courses. With the utilization of LEGS skills during animal disaster management, this strategy ended up being more participatory, cognitive of community needs and delivering the most appropriate intervention that helped the affected animals and the community (LEGS handbook, 2014). This approach has been widely supported by the Global LEGS coordination office for capacity building on emergency interventions.

CONCLUSION

The action to entrench courses on disaster management modules, LEGS and VERU within veterinary curriculum in Kenya proved to generate benefits to the stakeholders. The strategy produced trained human resource who

intervened with generated benefits for restoring livelihood of the disaster vulnerable farmers. These benefits support a strategy to incorporate the modules into the veterinary curriculum and recommendations are made to entrench such courses in all veterinary curricula that lack the courses.

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